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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/042,529 | 01/08/2002 | Jay Rod Walton | PA010486 | 5530 |
| 23696 | 7590 | 07/13/2004 | EXAMINER | |
| Qualcomm Incorporated Patents Department 5775 Morehouse Drive San Diego, CA 92121-1714 | | | SCHULTZ, WILLIAM C | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2664 | |

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------|---------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/042,529 | WALTON ET AL. |
| | Examiner | Art Unit |
| | William C. Schultz | 2664 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 April 2004.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-65 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-6,9,12-13,15,22-24,28-31,34,38,44,47-48,50-55,58,60-65, is/are rejected.

7) Claim(s) 7,8,10,11,14,16-21,25-27,32,33,35-37,39-43,45,46,49,56,57 and 59 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 9,12-13,15,22-24,28-31,34,38,44,47-48,50-55,58,60-65 are rejected under 35 U.S.C. 102(e) as being anticipated by Paulraj et al. [U.S. Pat. 6,351,499].

Regarding claims 1-3,12,13,28,29,30,31,44,47,48,52-54,58,61-65, Paulraj et al. discloses a method for scheduling data transmission for a plurality of terminals in a wireless communication system, comprising:

forming at least one set of terminals for possible data transmission for each of a plurality of frequency bands, wherein each set includes one or more terminals and corresponds to a hypothesis to be evaluated; (**col. 6, line 66 – col. 7, line 19**)

evaluating the performance of each hypothesis; (**col. 7, lines 57-67**)

selecting one hypothesis for each frequency band based on the evaluated performance; and (**col. 10, lines 23-31**)

scheduling the one or more terminals in each selected hypothesis for data transmission on the corresponding frequency band. (**col. 7, lines 20-32 – disclosed is Space- Time coding, another way to think of space-time coding is timeslots.**

Because each stream is transmitted in a separate slot varied by codes the data has been scheduled for transmission, each piece of data in it's own code slot)

Regarding claim 44, Paulraj et al. discloses a multiple-input multiple-output (MIMO) communication system utilizing orthogonal frequency division multiplexing (OFDM), a method for scheduling downlink data transmission for a plurality of terminals, comprising: **(fig. 1)**

forming at least one set of terminals for possible data transmission for each of a plurality of frequency bands, wherein each set includes one or more terminals and corresponds to a hypothesis to be evaluated, and wherein each frequency band corresponds to a respective group of one or more frequency subchannels; **(col. 6, line 66 – col. 7, line 19)**

forming one or more sub-hypotheses for each hypothesis, wherein each subhypothesis corresponds to specific assignments of a plurality of transmit antennas to the one or more terminals in the hypothesis; **(col. 7, lines 57-67)**

evaluating the performance of each sub-hypothesis; **(col. 7, lines 57-67)**

selecting one sub-hypothesis for each frequency band based on the evaluated performance; and **(col. 10, lines 23-31)**

scheduling the one or more terminals in each selected sub-hypothesis for downlink data transmission on the corresponding frequency band. **(col. 7, lines 20-32)**

further regarding claims 52,53, Paulraj et al. discloses the DSPD device in the disclosed embodiments above and in figure 4. **(col. 9, line 22 – col. 10, line 55)**

further regarding claim 58, Paulraj et al. discloses the device is a BTS in figure 1,2. (col. 5, line 45 – col. 6, line 3)

further regarding claims 62,65, Paulraj et al. discloses the device uses OFDM. (col. 12, lines 11-35)

Regarding claims 4,5,6,55, Paulraj et al. further discloses forming one or more sub-hypotheses for each hypothesis, wherein each subhypothesis corresponds to specific assignments of a plurality of transmit antennas to the one or more terminals in the hypothesis, and wherein the performance of each subhypothesis is evaluated and one sub-hypothesis is selected for each frequency band based on the evaluated performance. (col. 7, lines 20-28; col. 8, lines 1-10, lines 23-26; col. 9, lines 1-12)

Regarding claims 9,24,38,60, Paulraj et al. further discloses forming a channel response matrix for a plurality of terminals in a particular hypothesis, and wherein the performance of the hypothesis is evaluated based on the channel response matrix. (col. 9, lines 29-45)

Regarding claims 15,22,23,34,50,51, Paulraj et al. further discloses each sub-hypothesis is evaluated by

processing signals hypothetically transmitted from the one or more terminals in the sub-hypothesis to provide processed signals, and (col. 9, lines 52-55) estimating signal-to-noise-and-interference ratios (SNRs) for the processed signals. (col. 9, lines 61-68; col. 10, lines 1-15)

Allowable Subject Matter

Claims 7,8,10,11,14,16-21,25-27,32,33,35-37,39-43,45,46,49,56,57,59 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 4/19/2004 have been fully considered but they are not persuasive.

1) "Paulraj does not teach or recite the selection of a set of terminals"

This is not the language of the applied for claim 1. Claim 1 recites, "forming at least one set of terminals for possible data transmission ... wherein each set includes one or more terminals and corresponds to a hypothesis to be evaluated ... selecting one hypothesis ... scheduling the one or more terminals in each selected hypothesis for data transmission on the corresponding frequency band". Applicant admits that Paulraj does teach the forming of one set of terminals, for one transmit and one receive unit. Not only does Paulraj teach one set of terminals being formed but teaches multiple set being formed and just showing a single set as exemplary of the forming based upon a hypothesis. (col. 5, lines 51-55; col. 10 ,lines 47-55 – showing **selection of the frequency bands contained in matrix G(z)**)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Schultz whose telephone number is 703-305-2367. The examiner can normally be reached on M-F(7-4)(first bi-week) M-Th(7-4)(second bi-week).

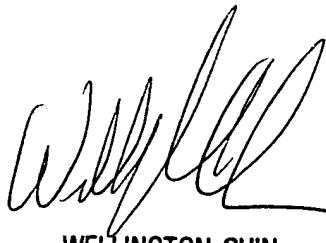
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 703-305-4366. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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